

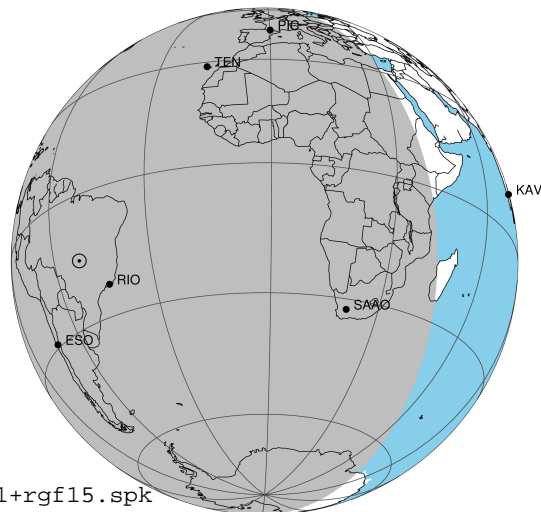
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-02T03:20:32.760
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068712993079920512
 2Mass ID (if available) : 17514729-2253424

Jupiter 2031-05-02T03:20:32 K8.87 G13.41 Pgt

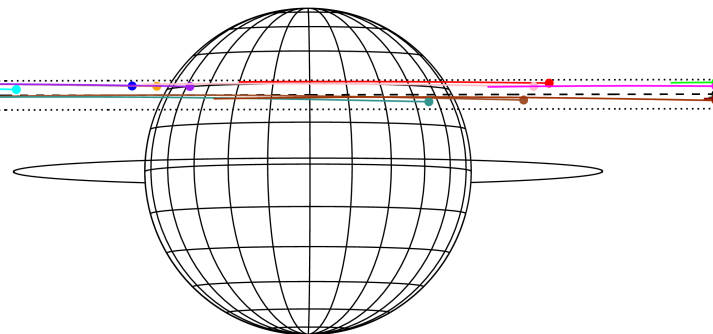
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s

RUWE (>1.4 is poor) : 1.19
 K magnitude : 8.869
 G magnitude : 13.407
 RP magnitude : 12.230
 BP magnitude : 14.882
 DUPflag : 0
 Distance (au) : 4.557
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -7.07
 Sun-Target sep (deg) : 133.01
 Sun-Moon sep (deg) : 110.43
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.05
 Pole direction: RA (deg): 268.05696
 Dec (deg): 64.49651
 C/A sky separation (") : 10.161
 C/A sky separation (km) : 33578.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-02T03:20:32 K8.87 G13.41
 Pgt



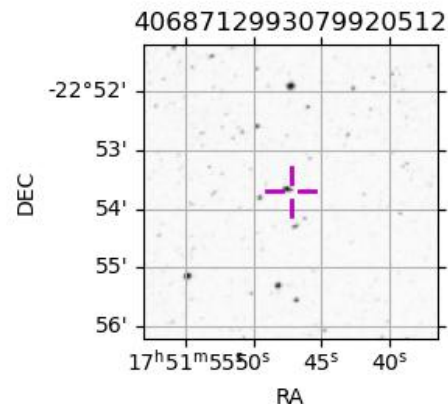
Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-05-02T03:20:32.7600 α: 17 51 47.29586 δ: -22 53 42.512 C/A ***** PA 180.11 deg v_sky - 7.07 km/s D 04.56 AU
 Credit: Styled after SORA/Lucky Star

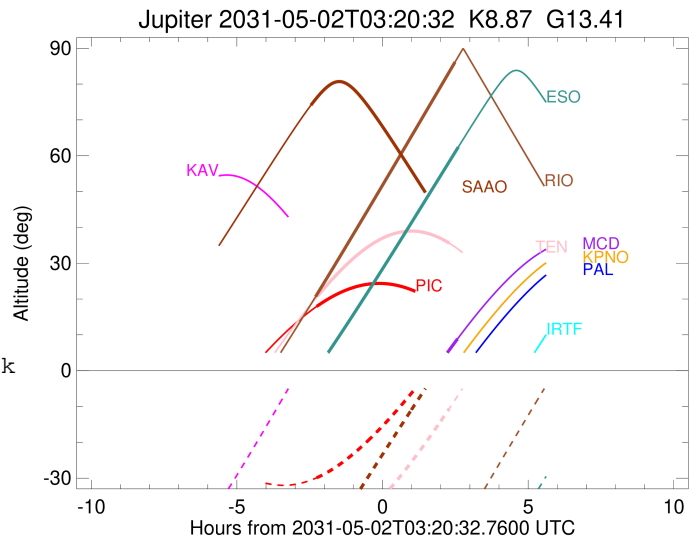
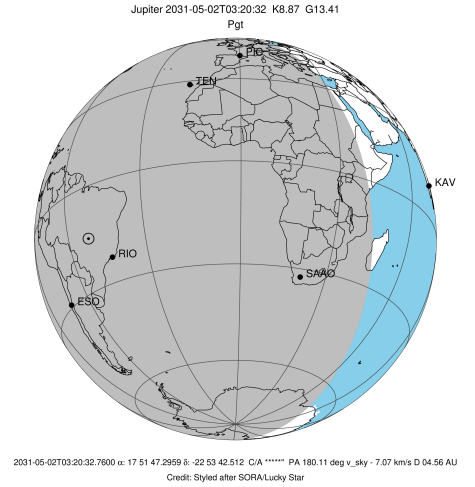
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 02 01:04 - MAY 02 01:04	Pin
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 02 05:55 - MAY 02 05:55	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	MAY 02 01:07 - MAY 02 05:37	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 02 01:02 - MAY 02 05:49	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 02 05:56 - MAY 02 05:56	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 02 00:53 - MAY 02 00:53	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-02T03:20:15.810
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 4068712993079920512
2Mass ID (if available) : 17514729-2253424
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s
RUWE (>1.4 is poor) : 1.19
K magnitude          : 8.869
G magnitude          : 13.407
RP magnitude         : 12.230
BP magnitude         : 14.882
DUPflag             : 0
Distance (au)        : 4.557
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.07
Sun-Target sep (deg) : 133.01
Sun-Moon sep (deg)  : 110.76
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 11.917
C/A sky separation (km): 39381.9
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

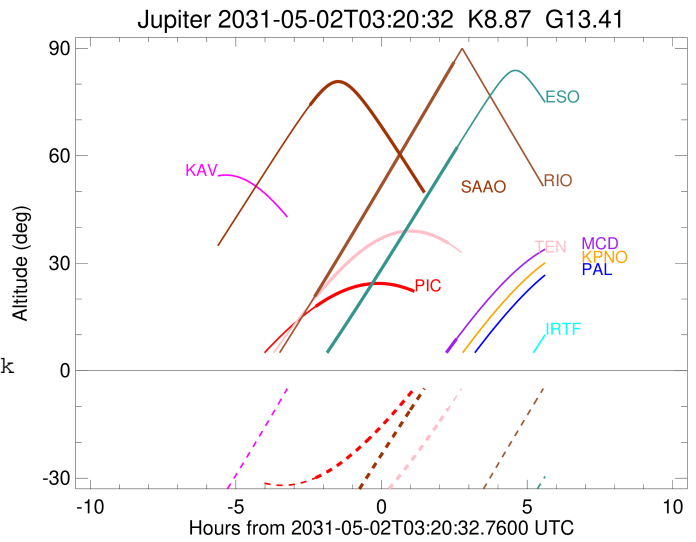
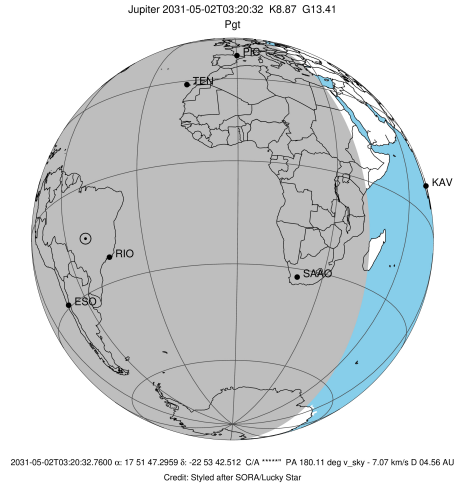


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T01:04:58.825	17.93	-29.89	71489.2	33.18	36.71
Jupiter	E	2031-05-02T05:35:00.740	16.68	6.49x	71489.2	33.00	36.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T03:31:25.510
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : MCD
Location             : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 4068712993079920512
2Mass ID (if available) : 17514729-2253424
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s
RUWE (>1.4 is poor) : 1.19
K magnitude          : 8.869
G magnitude          : 13.407
RP magnitude         : 12.230
BP magnitude         : 14.882
DUPflag             : 0
Distance (au)        : 4.556
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.07
Sun-Target sep (deg) : 133.01
Sun-Moon sep (deg)  : 110.37
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 10.959
C/A sky separation (km): 36215.3
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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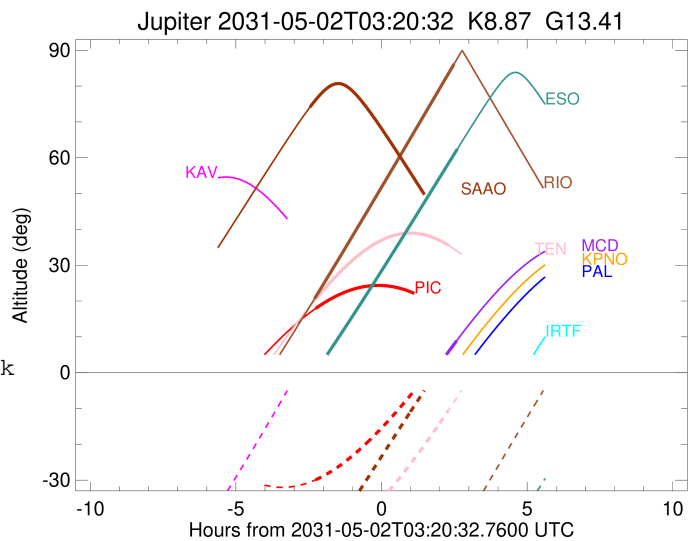
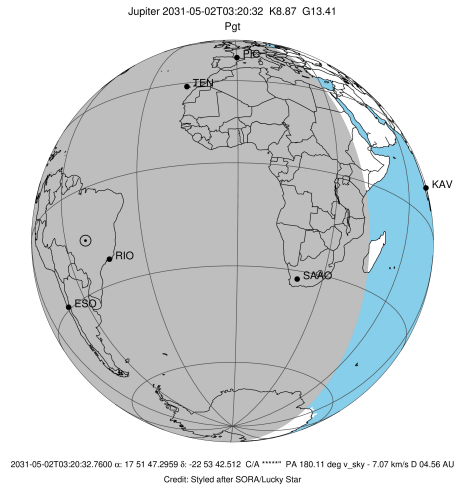


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T01:02:01.009	-51.23x	5.83x	71489.8	29.33	32.67
Jupiter	E	2031-05-02T05:55:11.946	8.88	-42.09	71489.5	31.55	35.01

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T03:23:19.100
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 4068712993079920512
2Mass ID (if available) : 17514729-2253424
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s
RUWE (>1.4 is poor) : 1.19
K magnitude           : 8.869
G magnitude           : 13.407
RP magnitude          : 12.230
BP magnitude          : 14.882
DUPflag              : 0
Distance (au)        : 4.556
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.07
Sun-Target sep (deg) : 133.01
Sun-Moon sep (deg)   : 111.01
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 11.641
C/A sky separation (km): 38471.3
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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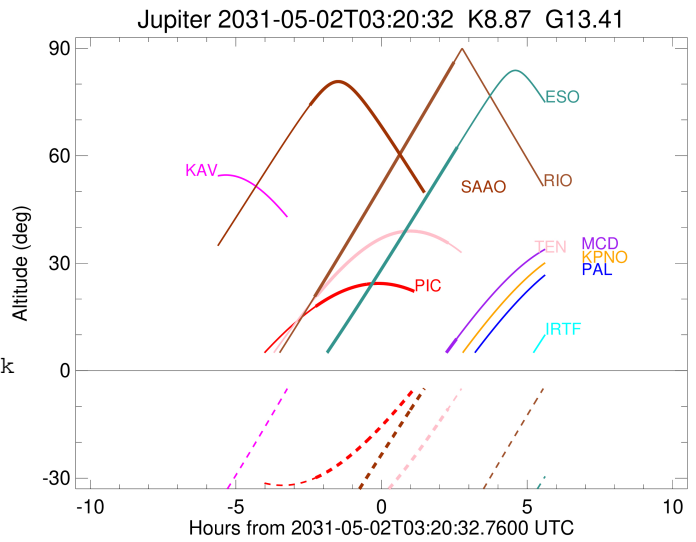
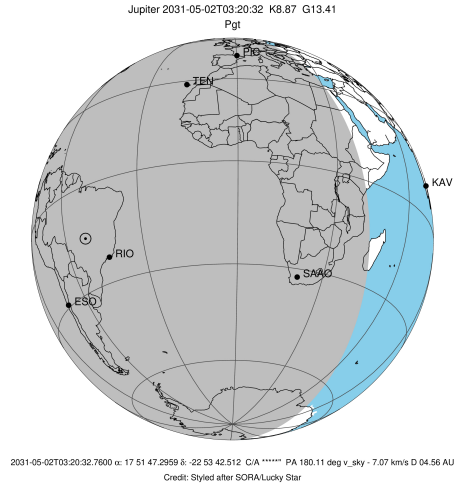


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T01:07:03.763	20.85	-46.59	71489.4	31.95	35.42
Jupiter	E	2031-05-02T05:37:55.819	35.60	-10.61	71489.3	32.40	35.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T03:28:17.100
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : RIO
Location              : Rio de Janeiro
Latitude (deg)        : -22.89506
E. Longitude (deg)    : 316.77708
Altitude (km)         : 0.033
Gaia source ID        : 4068712993079920512
2Mass ID (if available) : 17514729-2253424
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s
RUWE (>1.4 is poor) : 1.19
K magnitude           : 8.869
G magnitude           : 13.407
RP magnitude          : 12.230
BP magnitude          : 14.882
DUPflag              : 0
Distance (au)         : 4.556
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.07
Sun-Target sep (deg) : 133.01
Sun-Moon sep (deg)   : 111.32
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 10.009
C/A sky separation (km): 33075.8
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

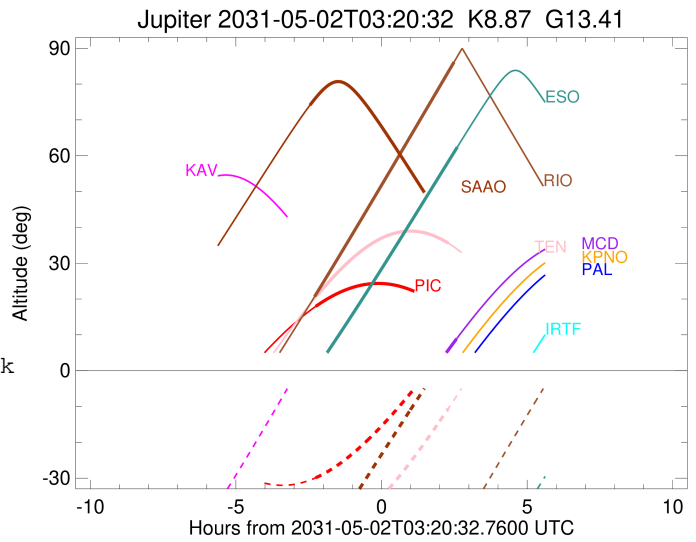
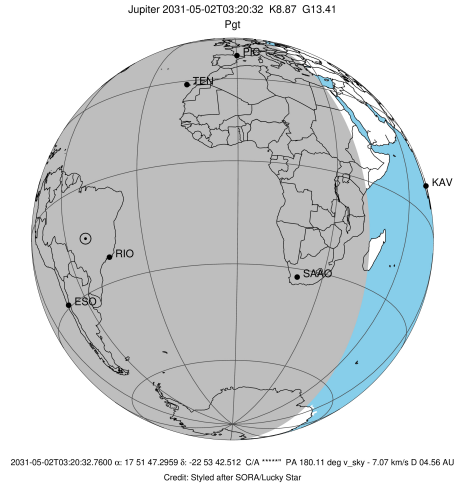


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T01:02:46.541	20.69	-63.63	71490.1	26.49	29.64
Jupiter	E	2031-05-02T05:49:57.465	86.14	-46.98	71490.0	27.93	31.17

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-02T03:31:06.440
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : ESO
Location            : European Southern Obs. (3.6m)
Latitude (deg)      : -29.26097
E. Longitude (deg)  : 289.26831
Altitude (km)       : 2.400
Gaia source ID      : 4068712993079920512
2Mass ID (if available) : 17514729-2253424
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s
RUWE (>1.4 is poor) : 1.19
K magnitude         : 8.869
G magnitude         : 13.407
RP magnitude        : 12.230
BP magnitude        : 14.882
DUPflag            : 0
Distance (au)       : 4.556
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -7.07
Sun-Target sep (deg) : 133.01
Sun-Moon sep (deg)  : 111.13
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (" ) : 9.562
C/A sky separation (km) : 31600.6
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

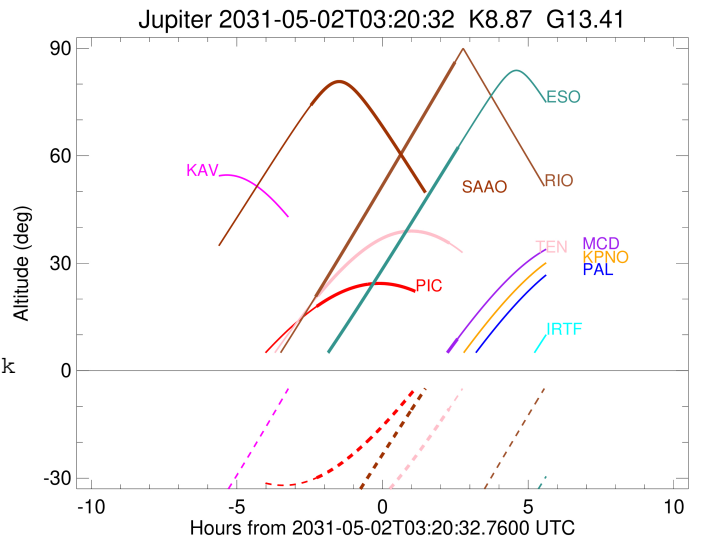
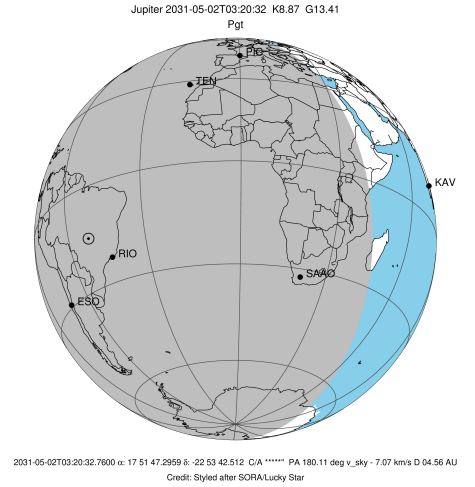


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T01:00:08.231	-0.60x	-37.73	71490.3	25.01	28.04
Jupiter	E	2031-05-02T05:56:41.660	62.41	-67.59	71490.1	27.04	30.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-02T03:16:29.740
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : SAAO
Location            : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)      : -32.37953
E. Longitude (deg)  : 20.81070
Altitude (km)       : 1.768
Gaia source ID      : 4068712993079920512
2Mass ID (if available) : 17514729-2253424
ICRS Star Coord at Epoch: 17h 51m 47.29586s -22:53:42.51204s
RUWE (>1.4 is poor) : 1.19
K magnitude          : 8.869
G magnitude          : 13.407
RP magnitude         : 12.230
BP magnitude         : 14.882
DUPflag             : 0
Distance (au)       : 4.557
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.07
Sun-Target sep (deg) : 133.01
Sun-Moon sep (deg)  : 111.14
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 9.805
C/A sky separation (km): 32401.8
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```



x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T00:53:11.902	74.12	-54.13	71490.1	27.05	30.23
Jupiter	E	2031-05-02T05:40:42.608	38.75	5.39x	71490.2	26.12	29.23